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Summary of the Work of the British Engineering Standards Association¹

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Secretary, British Engineering Standards Association

THE insistent demand created by the war for the maximum output of manufactured material in the minimum of time has naturally brought to the fore those means by which economy in production can be effected, and in this way standardization in the engineering world has become almost a word to conjure with, but like all good things, it must be taken in moderation, and the standards recommended must, by a process of periodic revision, be kept abreast of invention and progress; otherwise there is the danger of standardization becoming crystallization. It may fairly be said that the primary objects of standardization are to secure interchangeability of parts, to cheapen manufacture by eliminating the waste of time and material entailed in producing a multiplicity of designs for one and the same purpose, and also to expedite delivery and so reduce maintenance charges and stores.

ORGANIZATION AND PRINCIPLES

Seventeen years ago, however, neither the necessity nor the value of work of this character and still less its intimate relation to economy and speed of production were at all generally recognized, and it was to remedy the chaotic state of things then existing in the engineering industry of Great Britain that the late Sir John Wolfe Barry, K.C.B., F.R.S., in 1901 took the initial steps, when he brought the subject to the notice of the Council of the Institution of Civil Engineers, which resulted in the formation of the British Engineering Standards Committee.

From its inception, certain definite principles have governed the work of the committee, amongst which may be placed in the forefront the community of interest of producer and consumer, which is, in fact, the corner stone of the organization. It was also realized that the committee should not be an academical

¹ Reprinted from paper read before the Annual Meeting of The American Society of Mechanical Engineers, 29 West 39th Street, New York, December 3 to 6, 1918.

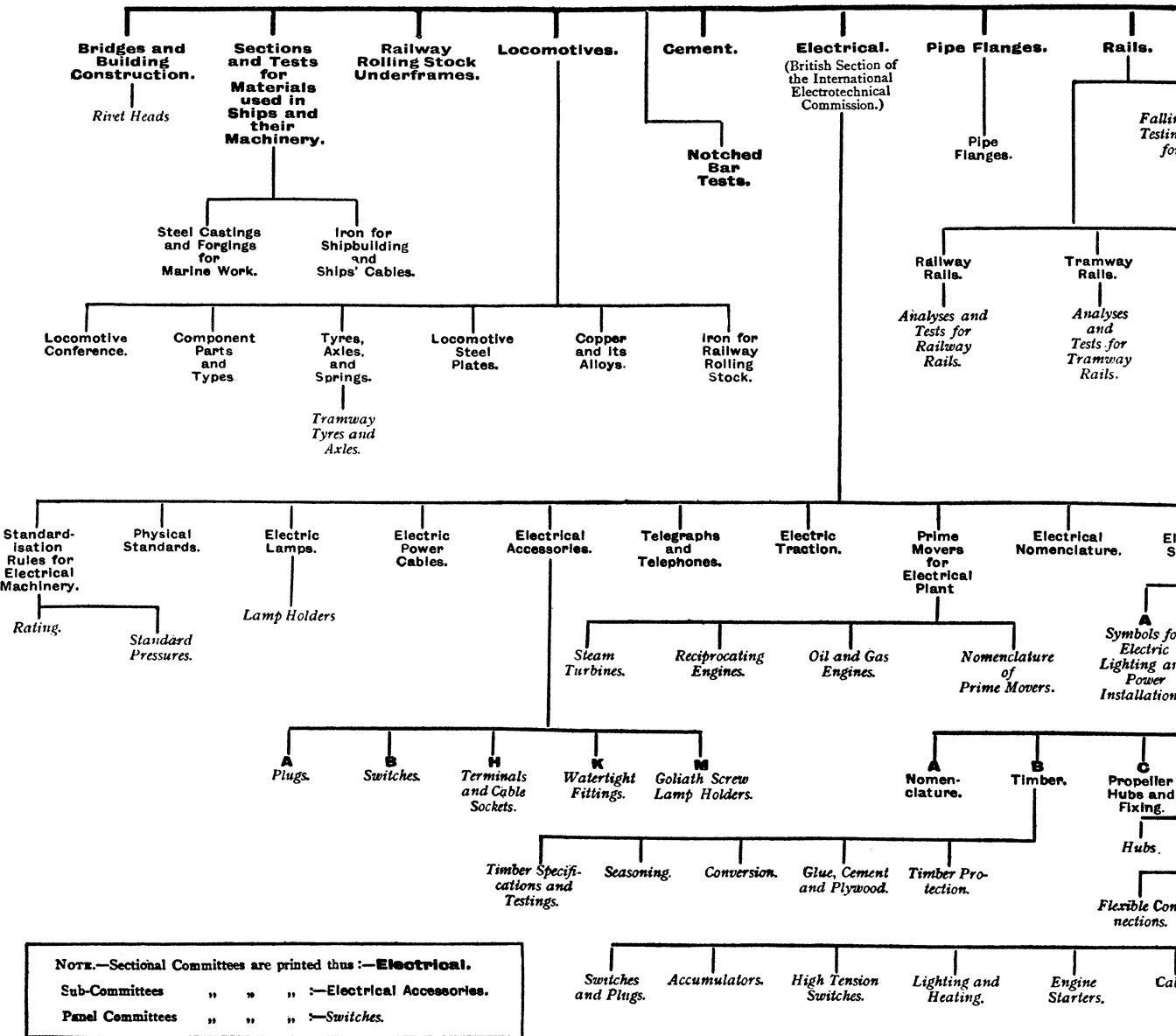
body, but an industrial organization in the closest touch with practical requirements and modern scientific knowledge and discovery; that it should only undertake standardization to meet recognized wants, and then only at the request of the principal interests concerned; that it should confine itself to setting up standards, leaving it to the user to satisfy himself by inspection and supervision that the standards were being adhered to; and, most important of all, that periodic revision of the standards should be undertaken so that improvements might be incorporated, the various industries thus being prevented from becoming stereotyped and their methods hidebound.

From the small nucleus of seven members who formed the original committee, a far-reaching organization has developed with some 160 committees, sub-committees and panels, including in all over 900 members and dealing under one central authority with standards relating to practically the whole field of engineering. Thus for many years past, the British Engineering Standards Association, as it is now called, has provided the neutral ground upon which the producer and the consumer, including the technical officers of the large spending departments of the government and the great classification societies, have met and considered this subject of such vital interest to the well-being of the engineering industry of the country. To the observance of the democratic and progressive principles outlined, coupled with the devoted labor of its members freely giving their time and experience to the work, often at great personal expense and inconvenience, may be attributed the increasing success of this work of growing national importance.

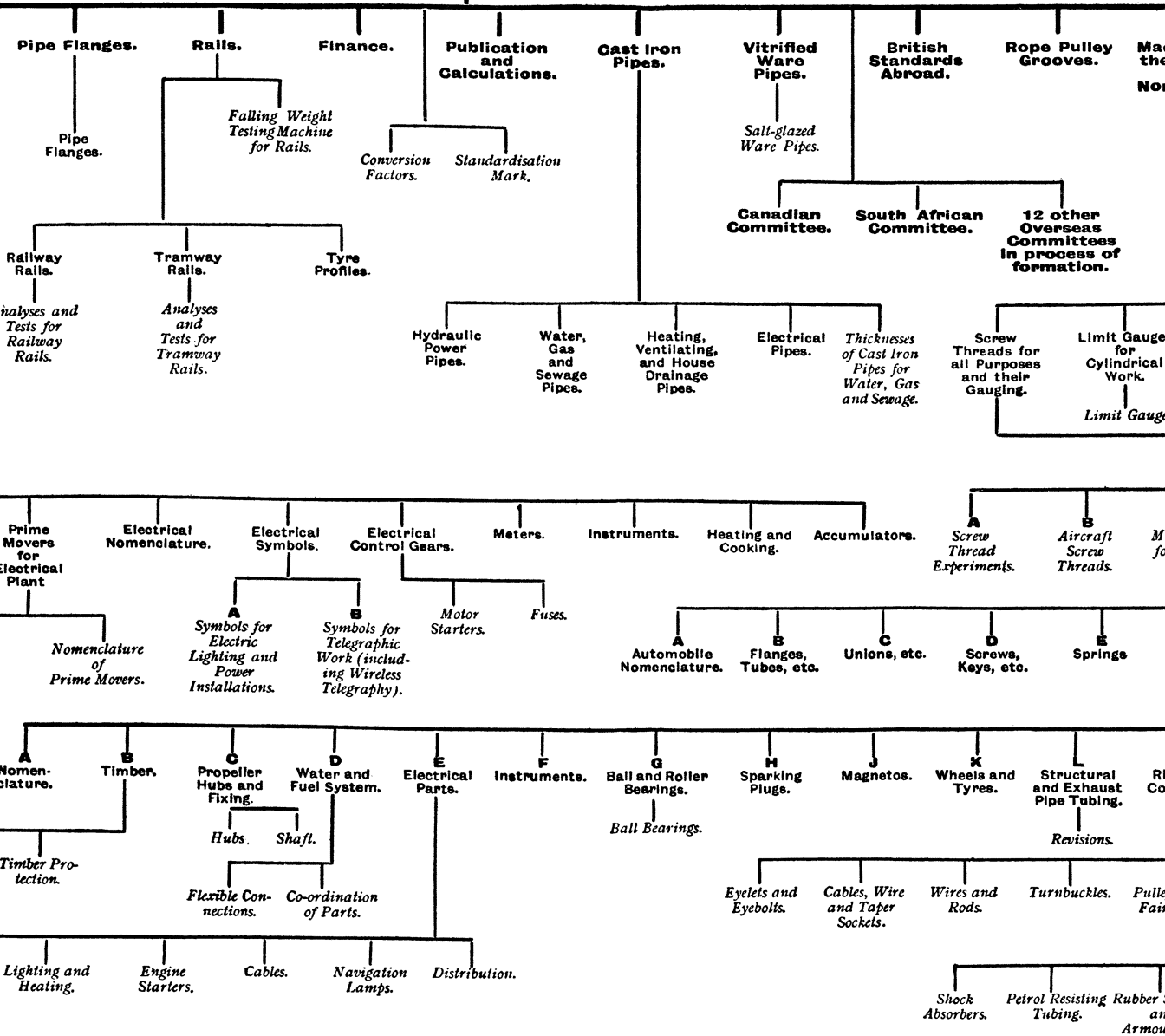
A large number of British standard specifications and reports have already been issued and these are constantly being added to, the most recent addition being the specifications for aircraft material and parts drawn up at the request of the Department of Aircraft Production of the Ministry of Munitions, for whom the association acts practically as the Departmental Specifications Committee.

TYPES OF STANDARDIZATION TAKEN UP BY THE COMMITTEE

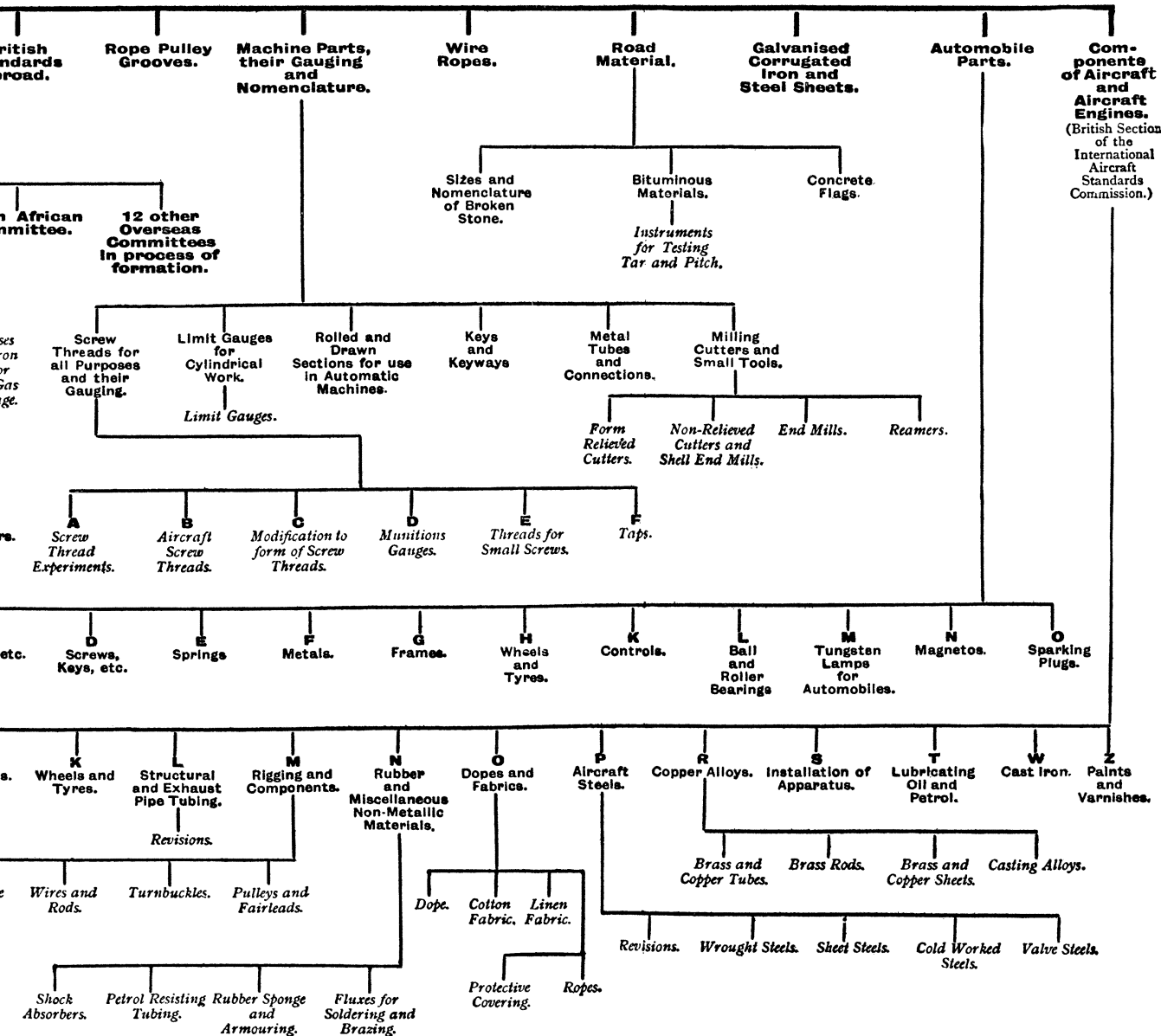
The standardization of steel sectional material was the first work taken up by the committee. The British standards for this



Main Committee.



ORGANIZATION CHART OF THE BRITISH ENGINEERING STANDARDS ASSOCIATION



material, so important in the construction of ships, bridges and underframes for railway wagons, have had a very wide adoption. The total number of sections is some 175, and the recently formed Mercantile Section of the Admiralty, as a war measure, was able to select from this list a largely reduced number and so put into operation an exceedingly economical measure with but little delay. The testing requirements of Lloyd's Register and the other great classification societies and the Board of Trade have been unified through the work of the committee.

It would appear from the steelmakers' returns for 1913, giving the tonnage of lengths rolled of each section, that 95.7 per cent had been produced by standard rolls and only 4.3 per cent by non-standard rolls, the work thus having proved of immense utility to the steelmakers. In the case of tramway rails, standardization has had the result of reducing to a minimum the sections required; at the present time there are only five standard sections as against over seventy sections prior to the advent of the committee. These sections are now being reduced to three, one being a special section for interurban tramways operating at a higher speed than those of the towns. As a further instance of the benefit of the committee's labors may be mentioned the standard specification for Portland cement, which is practically universally adopted throughout the country.

In regard to the electrical industry, the most important piece of work has been the issue of standardization rules for electrical machinery, in the drafting of which much benefit has accrued through the close and very cordial coöperation of the Standards Committee of the American Institute of Electrical Engineers. A large amount of standardization has been effected also for the automobile industry, especially in regard to the special steels used.

From time to time government departments have called upon the Standards Committee to carry out work for them, as, for instance, in the case of the Ministry of Munitions in relation to the question of screw-thread tolerances and the gauging of screws generally. Then the Indian Government requested the committee to undertake the question of standard designs for locomotives, and these have proved of immense value. The Road Board also asked the committee to draft specifications for road material. As already mentioned, at the request of the Department of Aircraft

Production, the association is dealing with the specifications for aircraft materials and parts as a war measure for the department. To carry on this important work a large number of sub-committees have been formed, consisting of officers from the technical, supply and inspection departments, together with representatives from the various trade organizations concerned; the specifications in this case are not published by the association in the ordinary way, but are issued to the Department of Aircraft Production, by whom they are sent to the various manufacturers of aircraft material on the government list, in this way becoming obligatory.

In regard to the question of finance, the funds for carrying out the work of the committee have been provided by the government and the industries concerned. In 1903 the government included in the estimates a substantial contribution, which was subsequently extended for the years 1904-5-6 by a grant-in-aid equal to the amount contributed by the supporting institutions, manufacturers and others. This was continued on a smaller scale down to 1916, and a further grant on the same condition is being continued to March, 1919. The Indian Government has been a generous supporter of the committee, and the governments of other overseas dominions have also given financial assistance. A liberal response to the committee's appeal for funds has been made by the engineering industry of the country and also by railway, shipping and the other companies, and by some of the local government boards and the tramway and electricity authorities. The expenses of the whole organization up to the war were under £4000 a year, but, owing to the widening of the field of its labors, this amount has been very greatly exceeded.

The committee, as many are aware, has recently become incorporated as an association, under license of the Board of Trade, in order to enable it in the first place to continue the work carried out by the Engineering Standards Committee, viz., to coördinate the efforts of producers and users for the improvement and standardization of engineering materials, and, secondly, in order to secure undisputed legal right to its mark or brand to be attached by manufacturers to their products as a hall-mark of goods made in accordance with the British standard specifications.

The chairman of the association is Sir Archibald Denny, Bart., who succeeded the late Sir John Wolfe Barry, to whose guiding

hand during the many years of his chairmanship, so much of the success of the movement is due. The Main Committee, as the governing committee is called, consists of members nominated by the leading technical institutions, viz., the Institutions of Civil Engineers, Mechanical Engineers, the Iron and Steel Institute, the Naval Architects, and the Institution of Electrical Engineers; there are also two representatives of the Federation of British Industries; and there are three members, not representative of any institution or association, but elected for their eminence in the profession.

The members of the Federation of British Industries give the various trade organizations connected with the work of standardization a direct channel through which to place their views before the main or executive committee of the association.

Rotation of office is provided in that the chairman and vice-chairman and one-third of the group of members retire annually, being eligible for reëlection. The Main Committee is the sole executive authority and all specifications and reports are presented to it for final adoption. The procedure before embarking on any new subject is to ascertain by means of a representative conference that there is a volume of opinion favorable to the work being undertaken. If such is the case, the Main Committee nominates the chairman of a sectional committee to take up the work in question, this committee being formed of technical officers representative of the various government departments interested, representatives of the trade organizations concerned, and, lastly, experts in the subject to be dealt with. The Main Committee does not dictate in any way either the number of members or the personnel of the sectional committee, only reserving to itself the right to nominate the chairman, though naturally it is guided in this matter also by the advice of the members.

THE COMMITTEE INTERNATIONAL IN SCOPE

Although the activities of the association have in the main been confined to the home country, a considerable amount of work of an international character has been undertaken. At the present time the association is coöperating with the American Institute of Electrical Engineers in several directions in regard to electrical apparatus generally. Then there is the great question of the

standardization of screw threads and also of milling cutters and small tools, in connection with which the American Society of Mechanical Engineers will be able to render most valuable assistance. Indeed, there is a wide field for Anglo-American agreement on engineering standardization generally and the association looks forward to a large measure of intimate coöperation with this object in view.

In connection also with its labors outside the home country, the association is developing a scheme for assisting in procuring the wider dissemination of British standards, and is undertaking the translation of its more important reports into various foreign languages, as well as setting up, with the assistance of the Overseas Department of the Board of Trade, local committees of British engineers and traders in some of the more important trading centres of the world.

That the value and utility of the work of the association is becoming more and more recognized both at home and abroad is evidenced by the amount of new work it is continually being invited to undertake as well as by the inquiries received from all parts of the world both with reference to the standards and to the organization itself.

The most recent addition to the association's activities is that of the standardization of the details in the construction of ships and their machinery. A conference recently convened at the instance of the Board of Trade, and representing government departments, shipowners, shipbuilders and engineers, classification societies and consulting and naval architects, has unanimously decided to recommend to the Main Committee the setting up of a complete section to deal with this branch of engineering, in which, in common with all others, economic production, fostered by interchangeability of detailed parts, is of such vital importance.

This brief account will, it is hoped, be sufficient to show that throughout the Empire, British standards are receiving increased recognition as being of direct utility to the engineering industry generally. Standardization, after all, is no more and no less than proper coördination. To effect it may necessitate the sinking of much personal opinion, but if its goal, through wideness of outlook and unity of thought and action, is the benefit of the community as a whole, standardization as a coördinated endeavor is bound increasingly to benefit humanity at large.